

How turbine oil system work in power plant?

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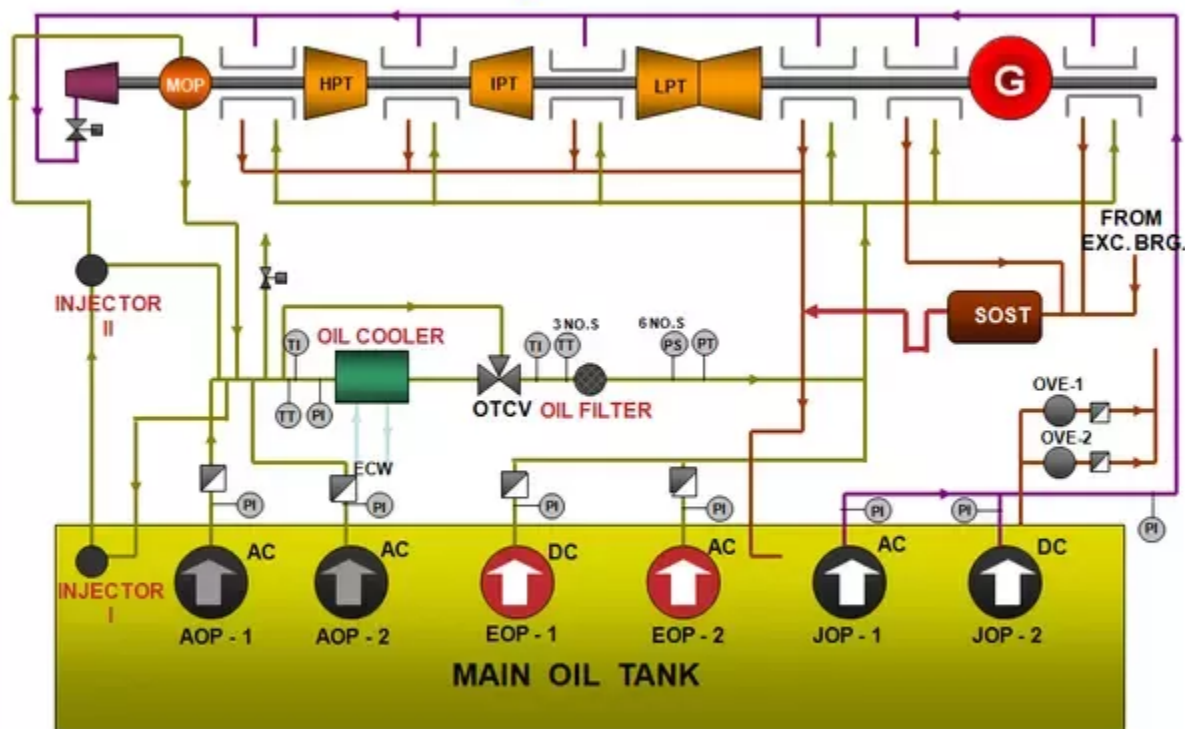
2 Answers



Anonymous

Answered Jan 25, 2016

OIL System Overview



TURBINE OILING SYSTEM

1. OIL SUPPLY

A single oil supply line lubricates and cools the bearing, governs the m/c and operates the hydraulic actuators and safety and protective devices.

During start-up & shut-down, aux oil pump supplies the control oil. Once the turbine speed is more than 2850 rpm, the main oil pump (M.O.P) takes over. It draws oil from main tank .The lubricating oil passes through oil cooler, before can be supplied to the bearing (Under emergency, lube oil can

be supplied by a DC oil pump). Before the turbine is turned or barred, Jacking oil pump (2 nos.) supplies high pressure oil to the jack up the TG shaft to prevent boundary lubrication and also supplies high pressure oil to drive the hydraulic motor (turning gear)

2) Turbine lubricating oil system

- **Function:**

1. Provides a supply of oil to journal bearings to give an oil wedge as the shaft rotates. 2. Maintains the temperature of turbine bearings constant at the required level. 3. Provides a medium for hydraulically operating the governor gear and controlling the steam

admission valves. 4. Provides for hydrogen cooled generators a sealing medium to prevent hydrogen leaking out along the shaft.

3) Main components

1) Main Oil Pump

2) Auxiliary Oil Pump

3) Emergency Oil Pump

4) Jacking Oil Pump

5) Main Oil Tank (MOT)

6) Centrifugal

3.1) Main Oil Pump

- This pump is located at the front bearing pedestal of the HP turbine.
- It is coupled to the turbine rotor through a gear coupling.
- When the turbine is running at a normal speed of 3000rpm, then the desired quantity of oil to the governing systems and the lubrication systems is supplied by this pump.

3.2) Auxiliary Oil Pump

- Auxiliary Oil Pump can meet the requirements of lubrication system under emergency conditions
- One stage vertical centrifugal pump driven by an A.C. electric motor.
- It has radial impeller and volute casing.

- The pump automatically takes over under interlock action whenever the oil pressure in the lubrication system fails below certain desired level.

3.3) Emergency Oil Pump

- Emergency oil pump has been foreseen by as a back-up protection to AC driven standby oil pump.
- This is a centrifugal pump, driven by DC electric motor.
- This automatically cuts in whenever there is a failure of AC supply at power station

3.4) Jacking Oil Pump:

- JOP ensures that there is no metal contact between a journal and the bearing.
- Positive displacement pumps that provide high pressure supply of oil under strategic journals of the turbo generator and oil lift the shaft slightly.
- This greatly reduces the static friction and bearing wear.
- The JOP can be stopped after the lubricating oil film is established between the shaft and bearings.
- Pressure produced is 120 bars

3.5) Main oil tank

- The oil used for lubrication is stored in the Main Oil Tank.
- Capacity - 20/32 m³.
- The Main Oil Tank holds the oil inside the tank for a period long enough to ensure liberation of air from the oil.
- Filters are located inside the tank to filter the oil during its normal course.
- The oil tank is supported on a framed structure just below the turbine floor at the left hand side of the turbine.

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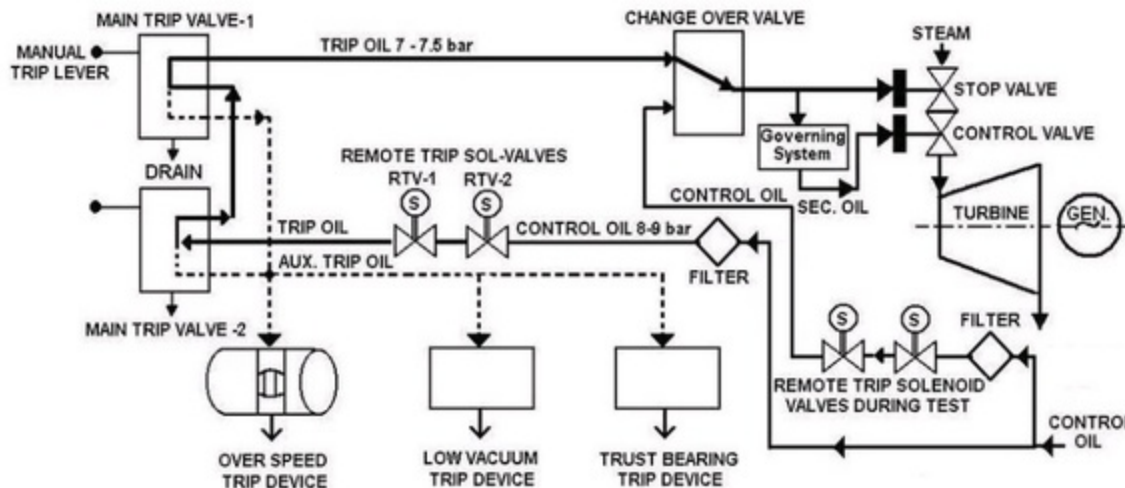
  


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Lokesh Gupta
Answered Mar 5



Turbine oil system component has been already demonstrated by few people, so in this question i would like to give ans as to how does turbine oil work i.e oil trip system.



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trip oil line above, this 7–7.5 kg/cm² oil pressure is to close ESV(emergency stop valve), IV(interceptor valve) & governing system. This line passes through two “main trip valve” connected in series. The main trip valve is held in open position by another oil line called as auxiliary oil line. In event of any mishaps this auxiliary oil pressure is allowed to drain in main trip valve, 2 as a result of this the valve of main trip valve 1 closes because auxiliary oil was keeping trip valve 1 open and since both the main trip valve were in series pressure decrease in main trip valve 2 decreases the pressure in main trip valve 1 as a result oil supply in the upper line falls and ESV, IP valve closes. Hence in this way turbine oil system works.

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